TAHOE REGIONAL PLANNING AGENCY

Forest Health & Wildfire Committee

November 16, 2022

Call to Order and Determination of Quorum

TAHOE REGIONAL PLANNING AGENCY

Forest Health & Wildfire Committee

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Agenda Item 1

Approval of Agenda

TAHOE REGIONAL PLANNING AGENCY

Forest Health & Wildfire Committee

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Agenda Item 2

Approval of Minutes

TAHOE REGIONAL PLANNING AGENCY

Forest Health & Wildfire Committee

November 16, 2022

Agenda Item 3

Presentation on On-Site Biomass Energy Unit to be proposed at South Tahoe Refuse

Proposed On-Site Green Waste Utilization: South Tahoe Refuse

TRPA Forest Health and Wildfire Committee

November 16, 2022

Kat McIntyre, PhD- TRPA

Jeff Tillman- South Tahoe Refuse

Meagan Hartman- Wisewood Energy

Overview

History and Background

Proposed Project and project proponent

- STR background
- Proposed project specifications
- Environmental, health, and safety compatibility

Next Steps

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ENVIRONMENTAL
IMPROVEMENT
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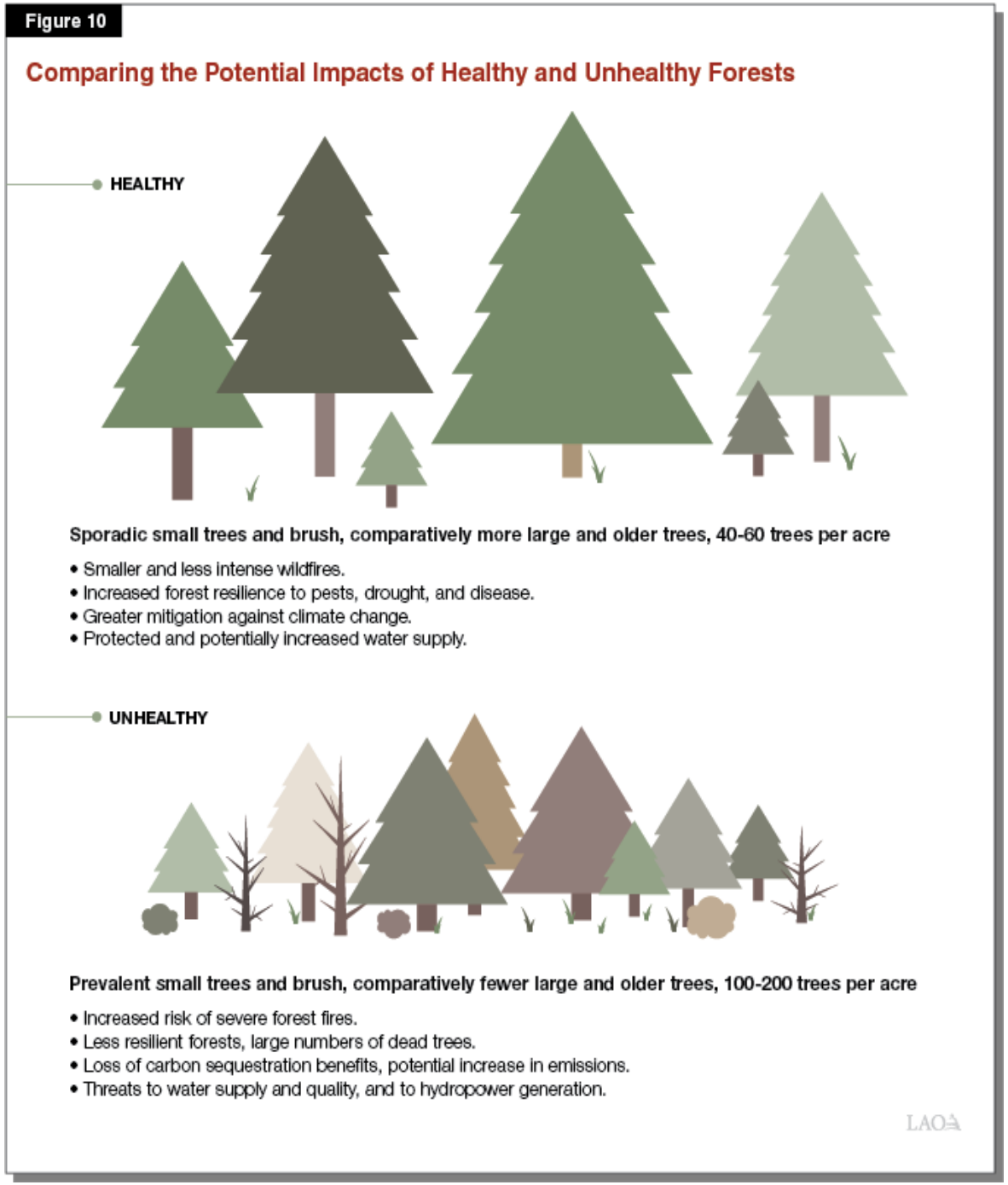
Environmental Context

- Forests today at risk for a variety of reasons:
  - A century of fire suppression paired with commercial harvesting of the largest trees left our forests homogenous and overstocked with small diameter trees and ladder fuels.
- Many forests across the west lack the resiliency to survive natural disturbances such as insects and disease, drought, all of which, are exacerbated by climate change.



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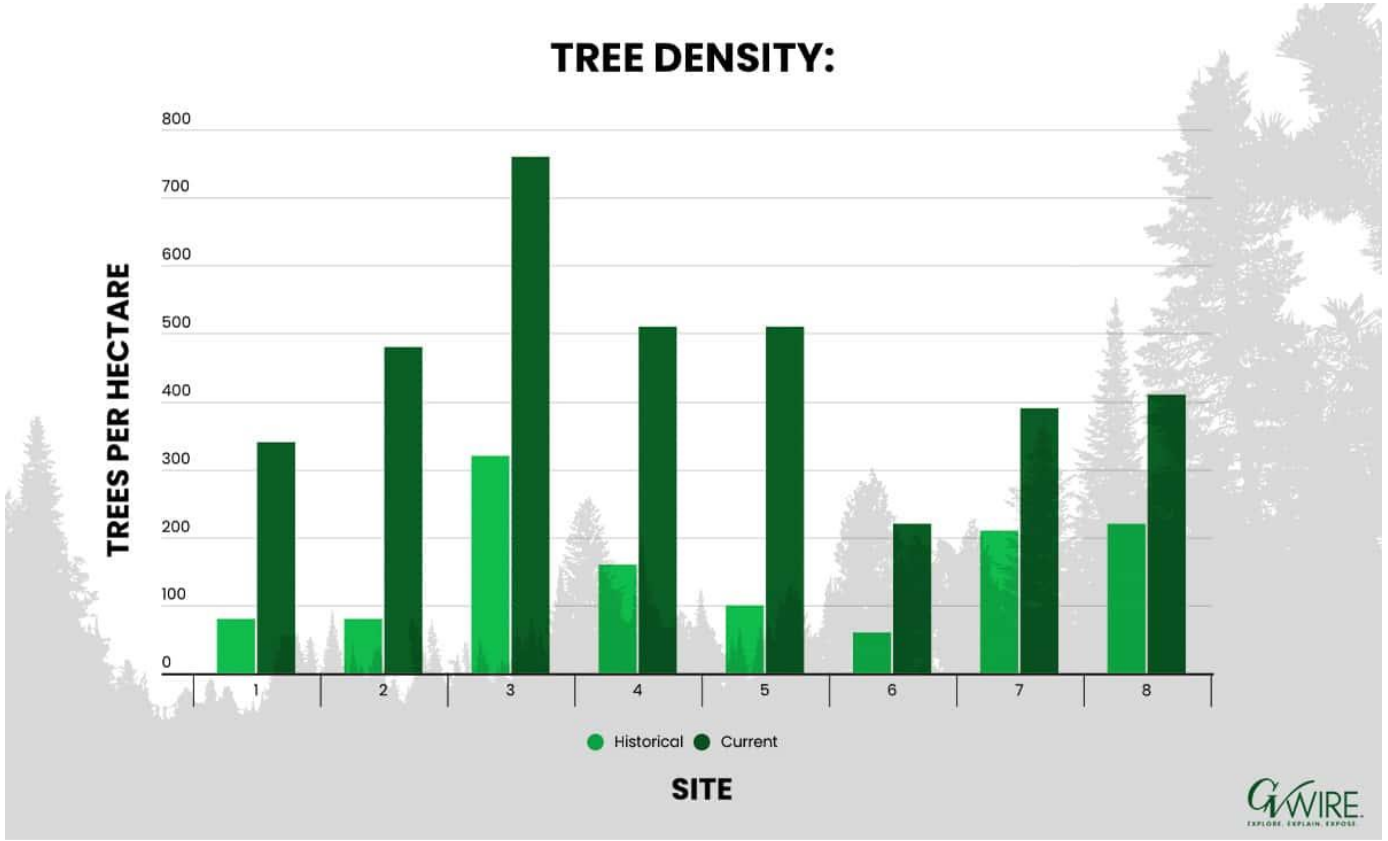
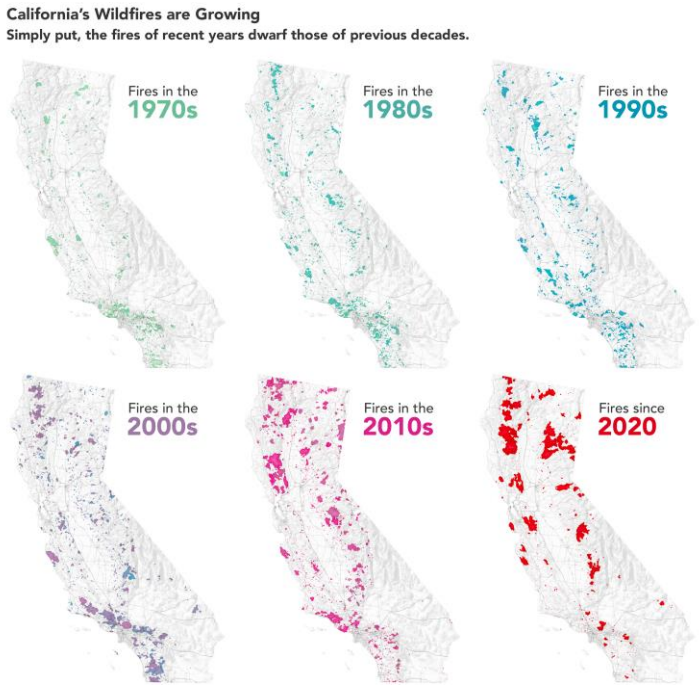
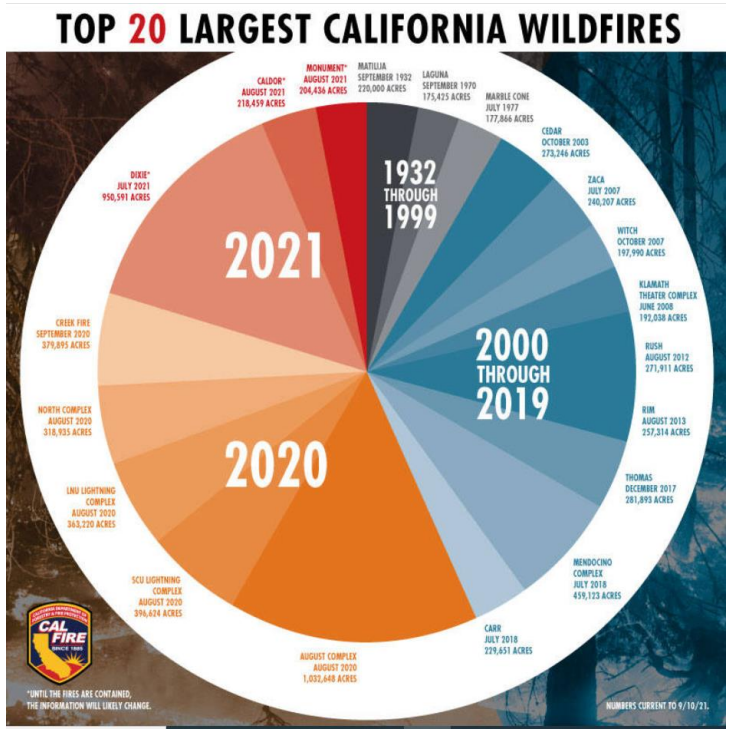
Historical vs Current: Trees per Hectare

Various sites throughout the Sierras





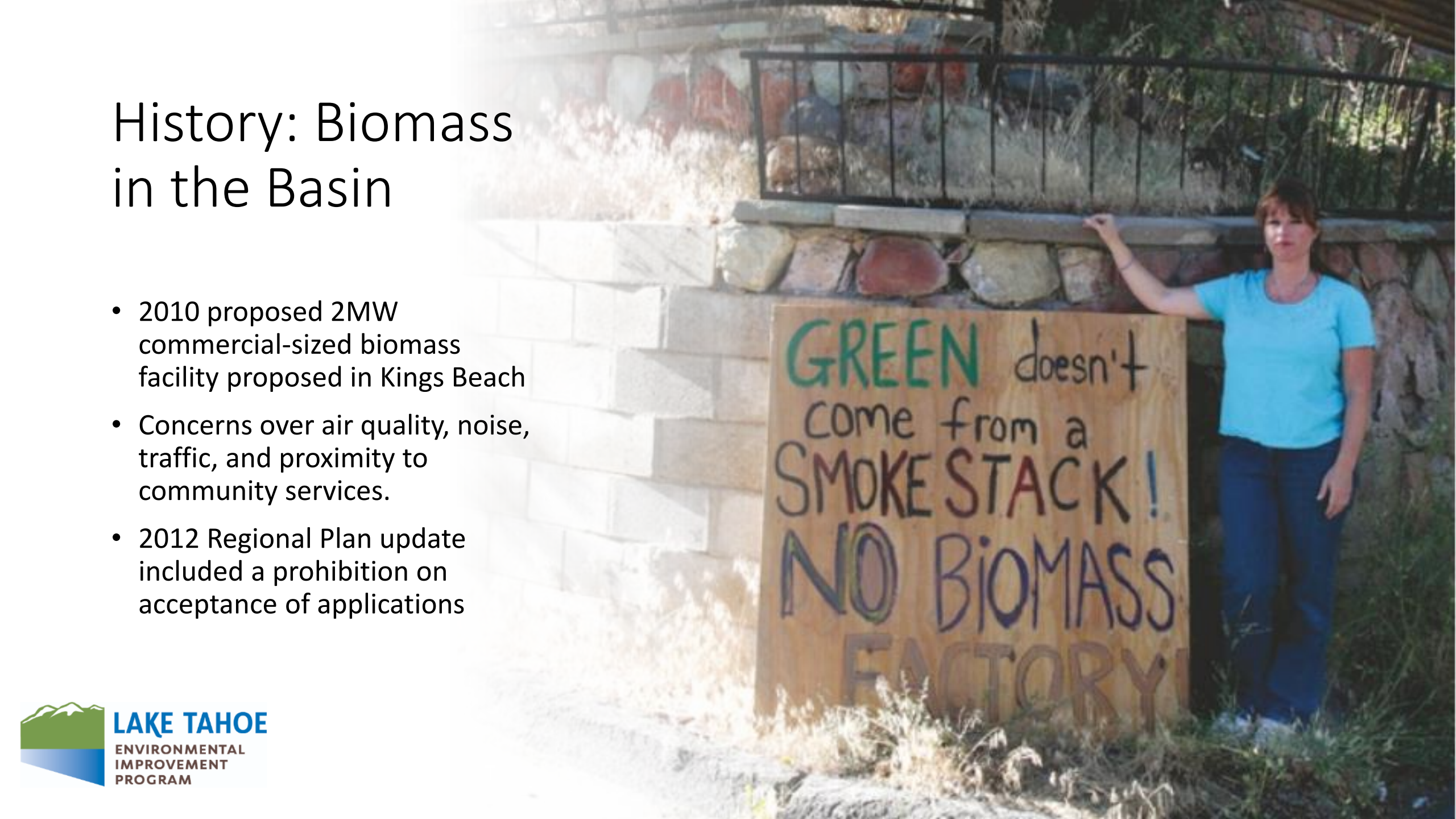


Forest Health and Climate Change

Angora Fire and Caldor Fire

History: Biomass in the Basin

- 2010 proposed 2MW commercial-sized biomass facility proposed in Kings Beach
- Concerns over air quality, noise, traffic, and proximity to community services.
- 2012 Regional Plan update included a prohibition on acceptance of applications



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Current Code Language: Chapter 65.1.F.

F. Biofuel Facilities

TRPA shall suspend acceptance of applications for biofuel facilities until further research demonstrates the safety and environmental compatibility of such facilities.

Biofuel Facilities

Facilities that combust or gasify forest and other plant materials in a manner that, in combination with other systems, generates electrical energy for use or distribution or generates heat for distribution within a building or facility. Any heating unit that meets the definition of a wood heater is not considered a biofuel facility.

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SOUTH TAHOE REFUSE
CLEAN ENERGY TECHNOLOGY PROPOSAL

South Tahoe Refuse & Recycling Services

TRPA Forest Health & Wildfire Committee
Proposed Project Presentation

November 16th, 2022

TAHOE REGIONAL PLANNING AGENCY

OUTLINE

- Why are we here
- Project background
- Environmental and safety impacts

WHY ARE WE HERE?

- South Tahoe Refuse (STR) is exploring a small-scale, net metered wood energy system that will offset grid electricity and natural gas used at South Tahoe facility
- Proposed system will use 10% of the annual waste woody material already received, processed, and transported out of the Tahoe Basin by STR
- In 2012 a pause was instituted on accepting applications for all new biomass energy facilities in the Tahoe Basin, in response to 2 MW power plant proposed for Kings Beach
- STR is seeking a TRPA decision to lift the moratorium for this pilot project, which would allow STR to proceed with standard permitting process

STR Clean Energy Technology Proposal

PROJECT BACKGROUND

About South Tahoe Refuse

- Provide waste management, collection and recycling services
- Family-owned company, serving the community since 1962
- Franchise agreements with Douglas Co., El Dorado Co., City of South Lake Tahoe
- Operate a Transfer Station with focus on recovery of recyclable material

About South Tahoe Refuse

South Tahoe Refuse & Recycling Services

- Located on 8 acres in South Lake Tahoe
- Process up to 370 tons of material/day
- Material Recovery Facility & Buy Back Center
- Resource Recovery Facility: organics recycling
  - 33,700 square foot building
  - Receive slash, trees, stumps, clean milled wood, & wood chip
  - In FY 2021-22 recycled 15,000 tons of organic material
- Overall diversion rate 60-65%

SCALES OF WOOD ENERGY

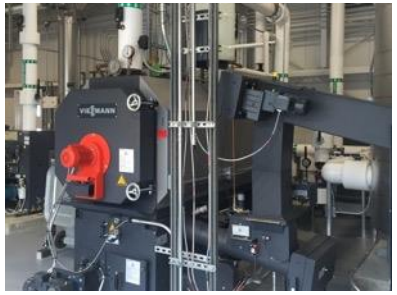
Industrial
Process Heat

District Heating

Increasing Scale

Power Export

Single Building Space
Heating



Net Metered CHP

"CHP" = Combined Heat-and-Power

PROPOSED WOOD ENERGY SYSTEM

- Proposed STR system is **small-scale, net metered** CHP gasifier
- Net metering **offsets energy used on-site** – no power sales to grid
- Energy produced 24/7, making gasifier a tool for **energy resilience**
- Gasification “bakes” woody material – **not direct combustion**
- 125kW estimated to **offset >100%** grid electricity and **>90% natural gas** usage at STR site on annual basis
- Examples of wood energy projects in or nearing construction include:

  - District energy plant at **Northstar Community Services District** in Placer County California
  - District heating for **Mount Bachelor Ski Resort** in Deschutes County Oregon
  - 2 MW power plant in **North Fork California**
  - 125 kW CHP system supporting a wood yard in **Tuolumne County California**

Modern, small-scale wood energy systems are common across the world, including a gasifier in South Tyrol, Italy; CHP in Quincy, CA; gasifier in Italy; district energy in Lech, Austria (pictured below).



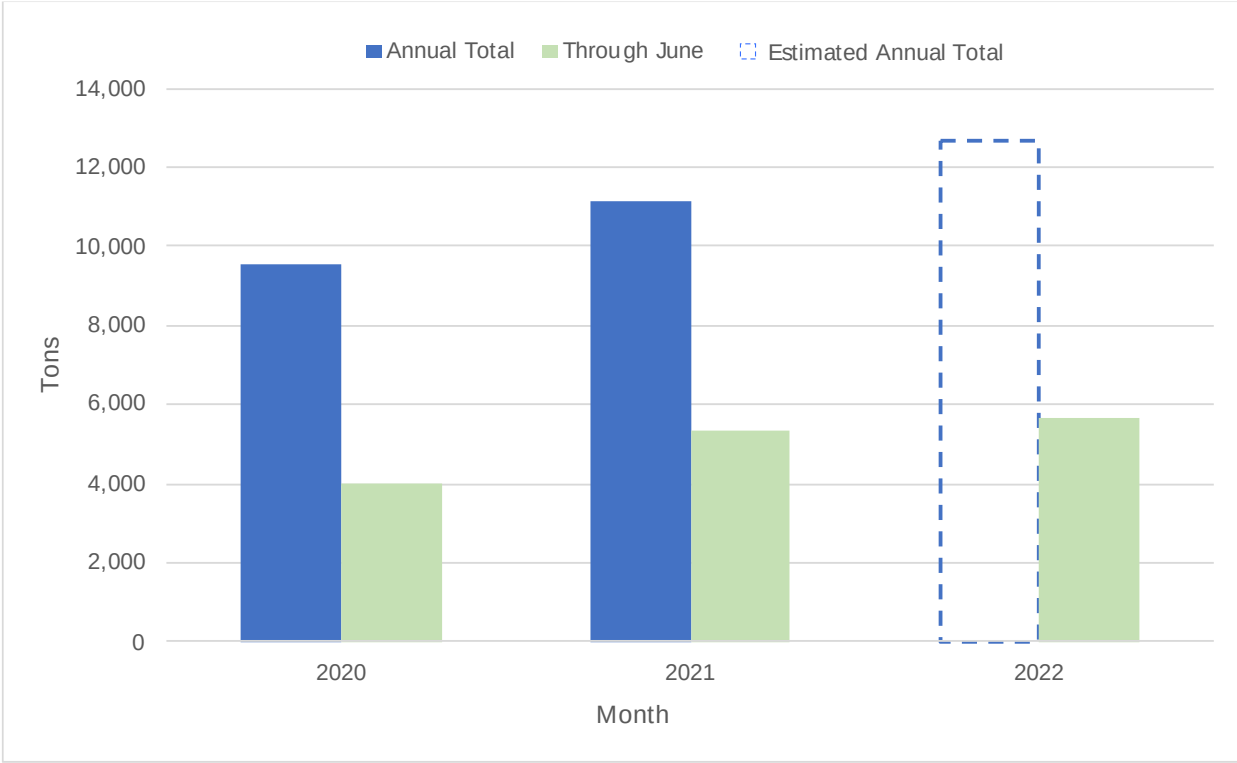

STR Clean Energy Technology Proposal

ENVIRONMENTAL & SAFETY IMPACTS

Fuel Demand

- STR receives and processes **~10,000 tons** of woody material each year, sourced from:
  - Defensible space and fire mitigation
  - Green yard debris
  - Clean construction and demolition material
- **Trending upward** from fires and increasing defensible space thinning
- Proposed wood energy system would use ~1,000 tons per year, or **10% of what STR currently handles**

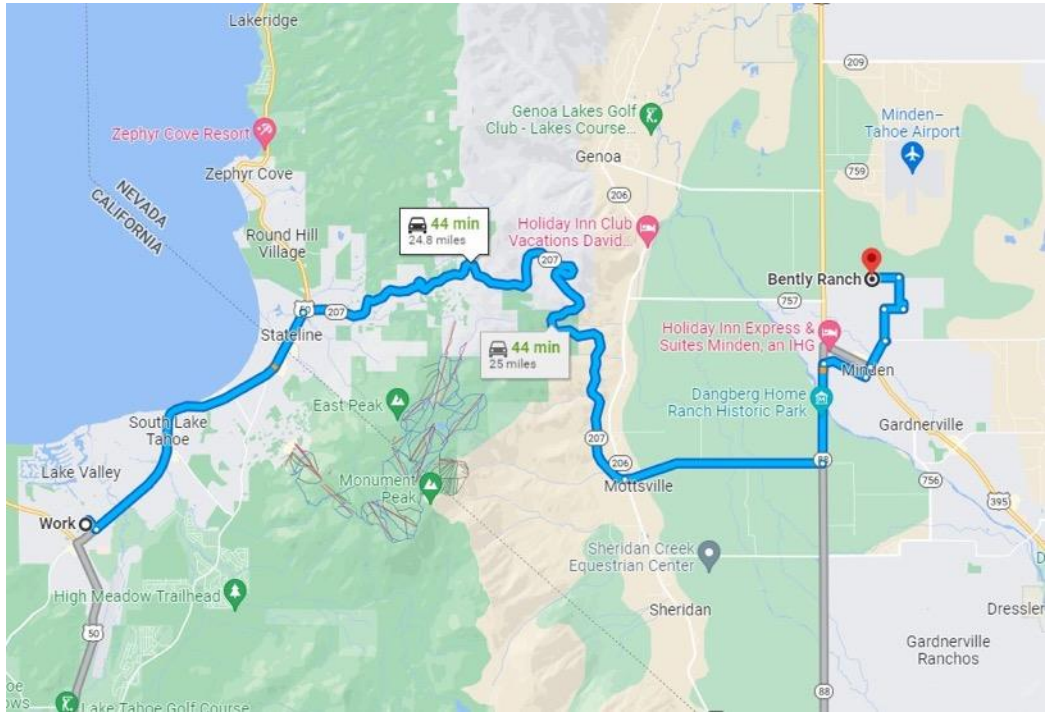
Tons of woody material received at STR and transported out of the Tahoe Basin for composting. Annual total for 2022 is estimated based on data available through June.



Project is not expected to incentivize new fuel reduction treatments in near term, but may contribute to community discussion about value of appropriately-sized wood energy

Traffic

	NO ACTION	WITH GASIFIER
AVG TRIPS/YR	700	628
MILES/YR (ROUNDTRIP)	34,650	31,050
PM (LB/YR)	23.38	20.95
CO (LB/YR)	214.12	191.87
CH_4 (LB/YR)	0.73	0.65
NO_X (LB/YR)	600.19	537.83



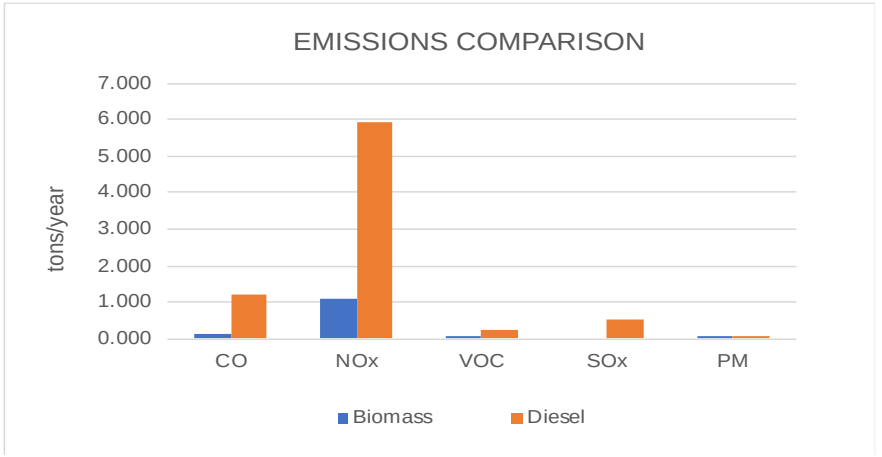
- STR currently transports chipped woody material 50 miles roundtrip out of the Basin for disposal as compost
- Gasifier system will:
  - **Reduce truck traffic** by about 72 trucks per year
  - **Reduce miles driven** by about 3,600 miles per year (roundtrip)
  - **Reduce associated emissions, truck noise, and safety** concerns

Air Quality

- **Low emission rates**, with potential offset needed for NOx
- **No visible smoke** during normal operations
- As energy resilience system, much **lower emissions** compared to similarly-sized diesel generator
- Additional emissions analysis can be completed at later stage

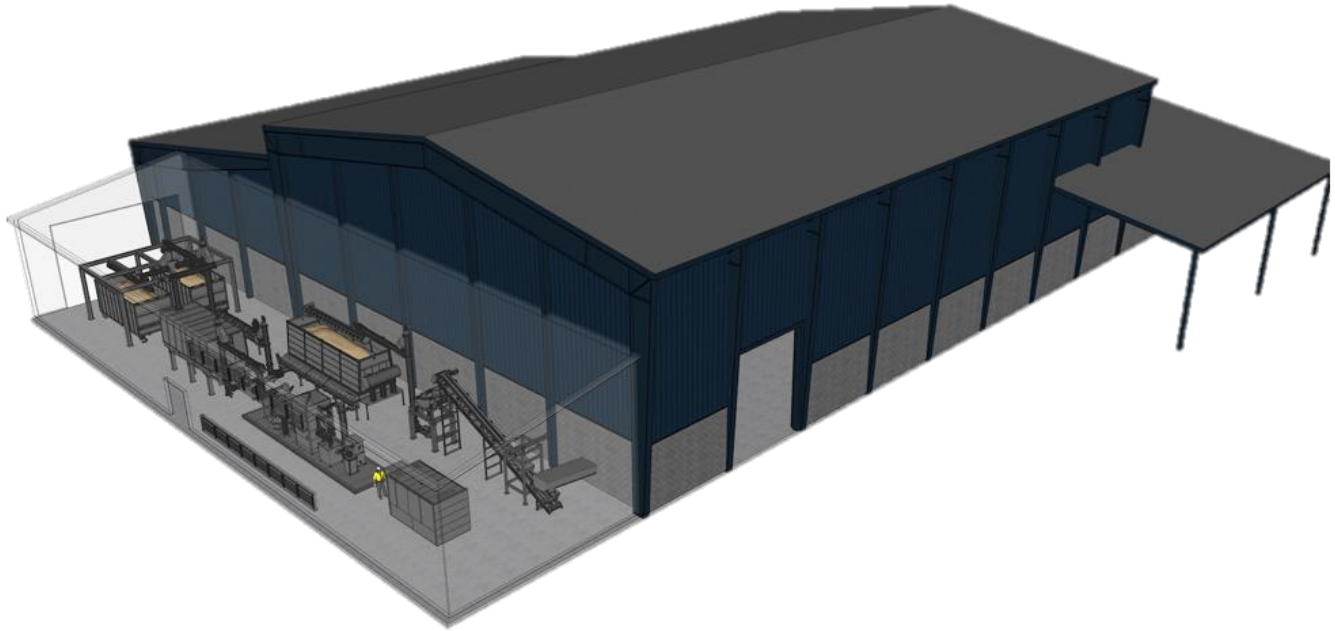
POLLUTANTS	EMISSION THRESHOLDS	PLANT EMISSIONS
ROG (LB/DAY)	82	0.027
NO_X (LB/HR)	0.068	0.498
CO (LB/HR)	3.7	0.038
PM_{10} (LB/HR)	0.41	0.019

190kW system running at full capacity and showing no visible smoke, located in South Tyrol, Italy.



Comparison of annual criteria pollutant emissions between a 125kW waste wood gasifier and a representative Tier 3 125kW diesel generator.

Site Suitability & Footprint



- Zoning: **commercial mixed use**
- Primary use: **miscellaneous improved industrial**
- Gasifier footprint is **within impervious coverage limits**
- **No change** to STR property footprint, no trees to be removed
- Detailed design and configuration to be completed in later project phase

Noise

- Current STR operations include early morning startup of waste collection vehicles, loading of material for transport, and grinding material.
- Daytime gasifier operations **not expected to be louder** than current noise levels
- Next phase of engineering will include design of enclosures to minimize sound during all hours of operations

STR current operations: 63 dBA

Avg ambient daytime noise levels: 59 dBA

Based on samples taken July 2022

Noise Sources	Sound Pressure Level [dBA][2]	Enclosure Attenuation [dBA][3]	Exhaust Silencer Attenuation [dBA][4]	Building Wall Attenuation [dBA][3]	Sound Pressure Level Outside CHP Building [dBA]
CHP Engine	95.9	-17.8	N/A	-17.8	60.4
CHP Engine Exhaust	77.0	N/A	-20.0	N/A	57.0
Air Compressor	75.0	N/A	N/A	-17.8	57.2

Safety

- Technology proposed for STR has been installed **throughout the world**, including in urban or semi-urban environments
- Operations typically involve brief **daily visual checks** on sensors and material flow, regular filter changes and other **preventative maintenance**, and **annual cleaning**
- No high-pressure equipment, hazardous materials, or high-risk equipment
- Not expected to generate **any unusual safety** or operational requirements

125kW gasifier system in Scotland.

IN SUMMARY

The proposed project will:

- Use waste woody material already being collected and processed by STR
- Decrease the number of waste hauling trucks traveling out of South Lake Tahoe
- Have minimal emissions and no visible smoke during operations
- Be contained within the current property footprint
- Have similar noise levels as current operations
- Represent a distributed renewable energy system that will offset on-site energy usage, not sell power to the grid
- Pilot a small-scale system that can help meet local goals for 100% 24/7 renewable energy

NEXT STEPS

Should the project be allowed to move forward:

- Complete more detailed analysis for permitting purposes
- Develop detailed engineering and incorporate considerations for emissions, noise, etc
- Submit permit application for TRPA review

WISEWOOD ENERGY

THANK YOU! QUESTIONS?

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Next Steps

- Staff feel the information provided by Wisewood Energy and STR is sufficient to allow TRPA to accept an application for review.
- A submitted application would come to the TRPA Governing Board for final review in 2023.
- Staff in partnership with Tahoe Conservancy have an opportunity to look more regionally at biomass utilization within the Tahoe Basin including:
  - Feedstock availability with current levels of treatment, outreach and stakeholder engagement, site suitability, etc.

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